CALTRANS
BMP RETROFIT PILOT PROGRAM

MAINTENANCE INDICATOR DOCUMENT

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CALTRANS BMP RETROFIT PILOT PROGRAM
BMP MAINTENANCE INDICATORS

The following specific thresholds are for specified and implied criteria which "trigger" maintenance activities for specific BMPs. The maintenance activity shown is for those times when the field measurement exceeds the maintenance indicator. These thresholds do not preclude taking other actions needed to mitigate the given thresholds or taking actions needed to correct unanticipated problems. These indicators are not only for the BMP pilot program, but they are also considered representative of the long-term maintenance requirements for the BMPs.

Prior to intrusive maintenance at any BMP, maintenance personnel should check with District biologist to ensure there are no endangered species, threatened species or species of special concern within the BMP maintenance area.

This level of effort does not include maintenance that may be necessary for vector control, particularly for devices that hold a permanent pool of water.

This document covers routine maintenance. There may be occasions where emergencies arise, such as accidents, toxic spills, or other incidents, where critical response is needed. On those occurrences, Caltrans crews will respond to the emergency, on a priority basis and, if necessary, the BMP will be taken out of service until the BMP functionality can be restored. The goal for such critical situations is to have the BMP back into service within 30 days.

The time period noted, for completion of any maintenance activity, is a goal that will depend on weather, access to the BMP, personnel and equipment availability.

BIOFILTER – STRIPS and SWALES

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
Uniform sheet flow over length of strip and across swale invert	Evidence of significant channeling, erosion, seeps, or ponding	Visual inspection of strip/swale	Annually.	Correct channelized, eroded, seeped, or ponded areas using additional fill and vegetation depending on coverage and/or by removing accumulated sediment. Complete prior to wet season.	None
Height of vegetation	Average vegetation height exceeds 12 inches, emergence of trees, or woody vegetation	Visual inspection of vegetation throughout strip/swale	Once during wet season, once during dry season. (depending on growth)	Cut vegetation to an average height of 6 inches	Remove any trees, or woody vegetation.
Assess adequate vegetative cover	Less than 90 percent coverage in strip invert/swale or less than 70 percent on swale side slope	Visual inspection of strip/swale. Prepare a site schematic to record location and distribution of barren or browning spots to be restored. File the schematic for assessment of persistent problems.	Assess quantity needed late wet season and late dry season.	Reseed/revegetate barren spots by Nov. Contact environmental or landscape architect for appropriate seed mix. Scarify area to be restored, to a depth of 2-inches. Restore side slope coverage with hydroseed mixture. If after 2 applications (2 seasons) of reseeding/revegetating and growth is unsuccessful both times, an erosion blanket or	Ensure reseed material is available for September.

BIOFILTER – STRIPS and SWALES

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
				equivalent protection will be installed over eroding areas	
Inspect for debris accumulation	Debris or litter present	Visual observation	During routine trashing, per Districts schedule.	Remove litter, and debris.	None
Inspect for accumulated sediment	Sediment at or near vegetation height, channeling of flow, inhibited flow due to change in slope.	Visual observation	Annually	Remove sediment. If flow is channeled, determine cause and take corrective action. If sediment becomes deep enough to change the flow gradient, remove sediment during dry season, characterize and properly dispose of sediment, and revegetate. Notify engineer to determine if regrading is necessary. If necessary, regrade to design specification and revegetate swale/strip. If regrading is necessary, the process should start in May. Revegetate strip/swale in Nov. Target completion prior to wet season.	None
Inspect for burrows	Burrows, holes, mounds	Visual observation	Annually and after vegetation trimming.	Where burrows cause seepage, erosion and leakage, backfill firmly.	None

BIOFILTER – STRIPS and SWALES

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
Inspect for standing water	Water accumulation in spreader ditch	Standing water in spreader ditch	Within 72 hours after a storm event 0.75 inches or greater.	De-water the spreader ditch to a depth of less than 0.25 inches. If sediment impedes the de-watering activity, then move or remove that portion of the sediment. Characterize and properly dispose.	Altadena Maintenance Station: De-water the spreader ditch to a depth of less than 0.25" by removing the bypass plug and allowing the water to drain into the infiltration trench. Use care to prevent sediment from discharging into the infiltration trench. Replace the bypass plug once the de-watering has been completed. At the end of the wet season, remove the bypass plug and allow the spreader ditch to drain. Use care to prevent sediment from discharging into the infiltration trench. Remove, characterize, and dispose of sediment from the spreader ditch. Replace the bypass plug before the beginning of the wet season.

BIOFILTER – STRIPS and SWALES

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
					Carlsbad Maintenance Station: De-water the spreader ditch to a depth of less than 0.25". Remove, characterize, and dispose of sediment from the spreader ditch. Clean weep holes in spreader ditch and drain the maximum amount of water. At the end of the wet season, characterize, and dispose of sediment from the spreader ditch.
General Maintenance Inspection	Inlet structures, outlet structures, side slopes or other features damaged, significant erosion, fence damage, etc.	Visual observation	Semi-Annually, late wet season and late dry season.	Corrective action prior to wet season. Consult engineer if an immediate solution is not evident.	

CONTINUOUS DEFLECTIVE SEPARATION (CDS) UNITS

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
Inspect sump for accumulation of material.	Unit 85 percent full or When the sump is 50% full during two consecutive monthly inspections.	Visual observation using a depth measuring gauge	Monthly during the wet season	Vactor unit or Empty basket when the unit is 85 percent full or 50% full during two consecutive monthly inspections or Annually in May, effect cleaning within 15 days	
Inspect unit for accumulation of floatable material.	Floatable material is 10 or more inches deep	Visual observation using a measuring gauge	Monthly during the wet season	Remove floatables	
Inspect weir box for accumulation of material.	Presence of trash and debris	Visual observation	Monthly during the wet season	Remove trash and debris while onsite conducting inspection.	
Inspect for standing water.	Standing water in sump	Visual observation	Annually, 72 hours after target[2] storm (0.75 in)	If standing water cannot be removed or remains through the wet season notify VCD.	None
Inspect the screen for damage and to ensure that it is properly fastened.	Screen becomes clogged, damaged or loose	Visual observation	Annually before wet season.	Clean screen.	None
Inspection for structural integrity	Holes in screen, large debris, damage to housing or weir box	Visual observation	Annually or after a cleanout.	Immediately consult with engineer and manufacturer's representative to develop a course of action, effect repairs prior to the wet season.	None

DRAIN INLET INSERTS – FOSSIL FILTER

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
Inspect for debris/trash	Sufficient debris/trash that could interfere with proper functioning of insert	Visual observation	During the wet season: • Before and once during each target[2] storm (0.25 in) event	Remove and properly dispose of debris/trash. Target completion period while onsite conducting inspection.	None
Oil and grease removal	Absorbent granules dark gray, or darker, or unit clogged with sediment.	Visual observation	• At the end of each target[2] storm (0.25 in) event	Replace Fossil Filter™ adsorbent within 10 working days. Characterize and properly dispose spent media prior to wet season.	None
Inspection for structural integrity	Broken or otherwise damaged insert	Visual observation	Twice per year in October and May.	Replace insert or immediately consult vendor to develop course of action, effect repairs within 10 working days	None
Annual renewal of medium	End of wet season, April 30	None	Annually, in May	Remove, characterize, and properly dispose of media and Replace media before Oct	None

DRAIN INLET INSERTS – STREAM GUARD

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
Sediment removal	Sediment more than 6-inches	Visual inspection of sediment collected within insert	During the wet season: • Before each target[2] storm (0.25 in) event	Replace insert. Target completion while onsite conducting inspection.	None
Inspect for debris/trash	Sufficient debris/trash that could interfere with proper functioning of insert	Visual observation	During the wet season • Before and once during each target[2] storm (0.25 in) event	Remove and dispose of debris/trash. Target completion period while onsite conducting inspection.	None
Oil and grease removal	When oil absorbent polymer becomes saturated with oil	Visual observation (absorbent polymer expansion indicates oil saturation)	Monthly	Within 10 working days, replace oil absorbent polymer	None
Inspection for structural integrity	Signs of rips, gashes, and/or fallen media	Visual observation	Twice per year in October and May.	Replace insert or immediately consult vendor to develop a course of action, effect repairs within 10 working days	None
Annual renewal of medium	End of wet season, April 30	None	Annually, in May	Remove characterize, and properly dispose of media and Replace media before Oct	None

EXTENDED DETENTION BASINS

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
Basin side slope planted for erosion protection and planted invert	Average vegetation height greater than 12-inches, emergence of trees or woody vegetation,	Visual observation and random measurements through out the side slope area	Once during wet season, once during dry season.	Cut vegetation to an average height of 6-inches and remove trimmings.	Remove any trees, or woody vegetation.
Slope stability	Evidence of erosion	Visual observation	October each year	Reseed/revegetate barren spots prior to wet season. Contact environmental or landscape architect for appropriate seed mix. Scarify surface if needed. If after two applications (2 seasons) of reseeding/revegetating and growth is unsuccessful both times, an erosion blanket or equivalent protection will be installed over eroding areas. No erosion blanket will be installed in the basin invert.	
Inspect for standing water.	Standing water for more than 72 hours	Visual observation	Annually, 72 hours after a target[2] storm (0.75 in) event	• Drain facility • Check and unclog clogged orifice. • Notify engineer, if immediate solution is not evident.	None

EXTENDED DETENTION BASINS

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
Inspection for trash and debris	Debris/trash present	Visual observation	During routine trashing, per Districts schedule.	Remove and dispose of trash and debris	None
Inspection for sediment management and characterization of sediment for removal	• Sediment depth exceeds marker on staff gage	• Measure depth at apparent maximum and minimum accumulation of sediment. Calculate average depth	Annually	Remove and properly dispose of sediment. Regrade if necessary.	None
Inspect for burrows	Burrows, holes, mounds	Visual observation	Annually and after vegetation trimming.	• Where burrows cause seepage, erosion and leakage, backfill firmly.	None
General Maintenance Inspection	Inlet structures, outlet structures, side slopes or other features damaged, significant erosion, graffiti or vandalism, fence damage, etc.	Visual observation	Semi-Annually, late wet season and late dry season	Corrective action prior to wet season. Consult engineers if immediate solution is not evident.	None

INFILTRATION BASINS

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
Vegetation of basin invert and side slopes	Vegetation height exceeds 12 inches, emergence of trees or woody vegetation,	Visual observation and random measurements through out the side slope and invert area	Once during wet season, once during dry season.	Cut vegetation to an average height of 6-inches.	Remove any trees, or woody vegetation.
Inspect for standing water.	Standing water for more than 72 hours	Visual observation	Annually, 72 hours after a target[2] storm (0.75 in) event.	• Drain facility, if possible. • Notify engineer to consider: • Remove sediment, scarify invert, and regrade if necessary. • If unable to achieve acceptable infiltration rate or implement alternative solution then move to decommission • If standing water cannot be removed then notify VCD.	None
Inspection for trash and debris at inlet structures	Debris/trash present	Visual observation	During routine trashing, per Districts schedule.	Remove and dispose of trash and debris	None
Inspection for sediment accumulation	Sediment depth exceeds marker on staff gage.	Measure depth at apparent maximum and minimum accumulation of sediment. Calculate average depth	Annually	Remove, characterize and properly dispose of sediment. Regrade and revegetate bare areas.	None
Slope stability	Evidence of erosion.	Visual observation	October each year.	Reseed/revegetate barren spots by Nov. Scarify	None

INFILTRATION BASINS
Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
				surface if needed. If after two applications (2 seasons) of reseeding/revegetating and growth is unsuccessful both times, an erosion blanket or equivalent protection will be installed over eroding areas. No erosion blanket will be installed in the basin invert. Contact environmental or landscape architect for appropriate seed mix.	
Inspect for burrows	Burrows, holes, mounds.	Visual observation	Annually and after vegetation trimming.	• Where burrows cause seepage, erosion and leakage, backfill firmly.	None
General Maintenance Inspection	Inlet structures, outlet structures, side slopes or other features damaged, significant erosion, graffiti or vandalism, fence damage, etc.	Visual observation	Semi-Annually, late wet season and late dry season	Take corrective action prior to wet season. Consult engineer if immediate solution is not evident.	None

INFILTRATION TRENCHES

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
Inspect for standing water	Standing surface water for more than 72 hours	Visual observation	Annually, 72 hours after a target[2] storm (0.75 in) event	• Drain facility • Notify engineer to consider: • Undertake investigation for course of action to achieve acceptable infiltration rate. If unable to achieve acceptable infiltration then BMP operations cease. • If standing water cannot be removed, notify VCD.	None
Inspection for trash and debris at inlet and outlet structures	Trash/debris present	Visual observation	During routine trashing per Districts schedule.	Remove and dispose of trash and debris.	None
Inspect for sediment accumulation	Visible sediment	Visual inspection of the stone aggregate, no sediment should be visible at the top of the trench due to sediment buildup from filter fabric.	Annually.	Remove top layer of trench, silt, filter fabric and stone, wash stone and reinstall fabric and stone into trench prior to wet season.	None
General Maintenance Inspection	Inlet structures, outlet structures, filter fabric or other features damaged,	Visual observation	Semi-Annually, late wet season and late dry season	Take corrective action, prior to wet season. Consult engineer if	Remove any trees, or woody vegetation.

INFILTRATION TRENCHES

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
	emergence of trees or woody vegetation, graffiti or vandalism, fence damage, etc.			immediate solution is not evident.	

MEDIA FILTERS – PERLITE/ZEOLITE

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
Design flow rate through canisters: 15 gpm per canister	Standing water in the filter vault, visible scum line in the vault that is higher than the overflow weir.	Remove top of canister check to see if media is discolored and packed with sediment.	During one storm per wet season	Replace canisters according to manufacturer recommendations.	None
Inspect for sediment accumulation in pre-treatment sedimentation chamber	Sediment occupies 10% of the filter chamber volume.	Measure with appropriate device	Annually in May.	Remove sediment prior to wet season. Characterize sediment and properly dispose	None
Inspect for minor maintenance	Per manufacture's guidelines	None	Annually	Clean per manufacturer's guidelines Prior to wet season.	None.
Manufacturer's recommended major maintenance	Per manufacture's guidelines	Per manufacture's guidelines	Annually	Consult with manufacturer regarding need for replacement of canisters. If manufacturer confirms need, replace plugged canisters. Prior to wet season. When canisters are changed send canisters to manufacturer to determine remaining life of the media	None
Inspection for trash and debris at inlet and outlet structures and within vaults	Trash/debris present	Visual observation	During routine trashing, per Districts schedule.	Remove and dispose of trash and debris when on site conducting inspections.	None
Inspect for standing water	Water accumulation in any structure or other	Standing water in any structure or other	Annually, at end of wet season.	• Gravity drain where	None

MEDIA FILTERS – PERLITE/ZEOLITE

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
	location within the filter	location within the filter		possible. • If standing water cannot be removed or remains through wet season notify VCD.	
General Maintenance Inspection	Inlet structures, outlet structures, vault, piping, or other features damaged and for graffiti or vandalism	Visual observation	Semi-Annually, late wet season and late dry season	Take corrective action prior to wet season. Consult engineer if immediate solution is not evident.	None

MEDIA FILTERS – SAND

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
Drain time of 48 hours	Drain time exceeds 72 hours	Determine drain time by visual observation	Annually, after one target[2] storm (0.25 in) event during wet season	• Remove sediment, trash and debris. • Check orifice • Notify engineer to consider removing top 2 inches of media and dispose of sediment. Restore media depth to 18 inches when overall media depth drops to 12 inches. Complete prior to wet season.	Escondido MS Delaware SF – Remove and restore media depth to 12 inches.
Inspect for sediment accumulation in sedimentation chamber	Sediment depth exceeds marker on staff gage.	Measure with appropriate device	Measure sediment depth annually.	Remove sediment prior to wet season. Characterize sediment and properly dispose.	
Inspection for trash / debris	Trash and debris present	Visual observation	. During routine trashing, per Districts schedule.	Remove and dispose of trash and debris during routine trashing.	None
Inspect pumps for proper functioning	Pump does not operate	Energize pump to see if water is discharged	After every storm.	Make assessment to determine if problem is electrical or mechanical. Take appropriate action. Replace pump if needed.	District 7 filters only
Inspect pumps for serviceability and periodic maintenance	Per manufacture's guidelines	Per manufacture's guidelines	Per manufacture's guidelines	Per manufacture's guidelines	District 7 filters only
Inspect for burrows	Burrows, holes, mounds.	Visual observation	Annual inspections after vegetation trimming.	• Where burrows cause seepage, erosion and leakage,	None

MEDIA FILTERS – SAND

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
				backfill firmly.	
Inspect for standing water	Water accumulation in any structure or other location within the filter	Standing water in any structure or other location within the filter	Annually, 72 hours after a target[2] storm (0.75 in)	• Gravity drain where possible. • Notify engineer, if immediate solution is not evident. • If standing water cannot be removed or remains through wet season notify VCD.	None
General Maintenance Inspection	Inlet structures, outlet structures, filter fabric or other features damaged, emergence of vegetation, graffiti or vandalism, fence damage, etc.	Visual observation	Semi-Annually, late wet season and late dry season	Within 30 working days, take corrective action. Consult engineer if immediate solution is not evident.	None

MULTI-CHAMBER TREATMENT TRAINS

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
Maximum filter drain time of 72 hrs for design and smaller storms	Drain time greater than 72 hours or sediment accumulation is greater than 0.1 inch over more than 50 percent of the fabric surface area.	Visual observation	After one target[2] storm (0.75 in) event during wet season.	• Remove and replace filter fabric blanket. • If problem persists, consult with engineer, the media may need to be replaced. Complete prior to wet season.	None
Inspection for trash/ debris at inlet and outlet structures and the MCTT	Trash and debris present	Visual observation	Semi-Annually, late wet season and late dry season	Remove and dispose of trash and debris During routine trashings.	None
Inspection for sediment accumulation	Sediment accumulates 50% of the volume underneath the tube settlers. Maximum of 2-feet grit chamber	Measure with appropriate device	Remove tube settler, measure sediment depth annually	Remove sediment prior to wet season. Characterize sediment and properly dispose.	None
Inspect for standing water	Water accumulation in any structure or other location within the device	Standing water in any structure or other location within the device	Annually	• Where gravity draining is possible, drain the standing water. Where gravity draining is not possible, pump water from the structure. All structures should be as dry as possible at the end of the Wet Season to prevent possible mosquito breeding.	None

MULTI-CHAMBER TREATMENT TRAINS

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
				• If standing water cannot be removed or remains through the wet season notify VCD.	
Replace filter media	When drain time exceeds 72 hours for a 0.75 in storm and media shows signs of clogging.	Visual Observation	Every 5 years or when drain time exceeds 72 hours for a 0.75 in storm and media shows signs of clogging.	Remove and replace filter media. Characterize and properly dispose.	None
Inspect sorbent pillows in main settling chamber	Darkened by oily material	Visual Observation	Annually, in May.	Annually, renew sorbent pillows, or immediately if pillows are darkened by oily material, characterize and properly dispose.	None
Inspect pumps for proper functioning	Pump does not operate	Energize pump to see if water is discharged	After every storm.	Make assessment to determine if problem is electrical or mechanical. Take appropriate action. Replace pump if needed.	None
Inspect pumps for serviceability and periodic maintenance	Per manufacture's guidelines	Per manufacture's guidelines	Per manufacture's guidelines	Per manufacture's guidelines	None
General Maintenance Inspection	Inlet structures, outlet structures, filter fabric, settling tubes or other features damaged, emergence of vegetation, graffiti or vandalism, fence damage, etc.	Visual observation	Semi-Annually, late wet season and late dry season	Within 30 working days, take corrective action. Consult engineer if immediate solution is not evident.	None

OIL-WATER SEPARATOR

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
Inspect for sediment accumulation in the pre-separator and separator chamber	Greater than 12-inches	Measure with appropriate device	Annually	Prior to wet season, remove the accumulated material. Characterize and properly dispose.	None
Inspect for oil accumulation in oil chamber	Oil depth is not more than 50 percent of chamber volume	Gauge the level of oil/water with a wooden gauge stick	Annually	Prior to wet season remove and properly dispose of oil and grease.	None
Inspect coalescer for debris and gummy deposits	Debris or gummy deposits present	Visual observation	Annually	Wash the coalescer in an appropriate area with high-pressure hot water when needed.	None
Inspect water level in tank	Less than full	Visual observation	Annually	Fill with water prior to wet season.	None
Inspect for general mechanical integrity	Per manufacture's guidelines	Per manufacture's guidelines	Annually	Operate each mechanical component to ensure proper operation. Repair as needed	None

WET BASIN

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
24-hour draw down measured between the rim of the outlet structure and invert of the WQ orifice in the outlet structure.	Drawdown greater than 25 hours or water is flowing over weir.	Evaluate drain time from inlet and outlet flow data loggers or observe 25 hours after target[2] storm (0.75 in) Observation of water flowing over spillway	Once during wet season and after completion or modification of the facility,	If >25-hours: • Open gate to discharge water to permanent pool elevation, • Clear outlet of debris. • Consult engineer if needed. If water is spilling over weir, open canal gate until water level is at permanent pool elevation. Check/clear outlet of debris.	None
Inspect for burrows	Burrows, holes, mounds	Visual observation	Annually and after vegetation trimming.	Where burrows cause seepage, erosion and leakage, backfill firmly.	None
General Maintenance Inspection	Inlet structures, outlet structures, side slopes or other features damaged, significant erosion, graffiti or vandalism, fence damage, etc.	Visual observation	Semi-Annually, late wet season and late dry season	Take corrective action, or restore to as-constructed condition prior to wet season. Consult engineers if immediate solution is not evident.	None

WET BASIN

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
Inspect Zone 1 [4] for vegetation coverage and density to sustain vector abatement efficacy *(See attachments for zone locations.)*	Observable vegetation coverage/density	Visual, visible vegetation growth or emergent vegetation growth	Quarterly	1. Have a biologist survey the Wet Basin to determine if any birds are nesting or other sensitive animals are present. If birds are nesting, with advice from the biologist, proceed with the maintenance. 2. Lower and maintain the water level to expose the area to be maintained, do not completely drain basin 3. Cut vegetation 4. Dispose of the vegetation material in a landfill or other appropriate disposal area. 5. Restock mosquito fish as recommended by vector control agency.	None

WET BASIN

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
Inspect Zone 2 [4] for vegetation coverage and density to sustain vector abatement efficacy	Vegetation density is such that mosquito fish cannot swim freely in the planted area.	Mosquito fish cannot be seen in the planted area, vegetation density approximately 80 to 100 percent	Quarterly	Annually, or at a special request of the local vector control agency 1. Have a biologist survey the Wet Basin to determine if any birds are nesting or other sensitive animals are present. If birds are nesting, with advice from the biologist, proceed with the maintenance. 2. Lower and maintain the water level to expose the area to be maintained, do not completely drain basin 3. Cut the vegetation to below the permanent pool water surface. 4. Dispose of the vegetation material in a landfill or other appropriate disposal area. 5. Monitor vegetation density quarterly to determine grow back rate.	None

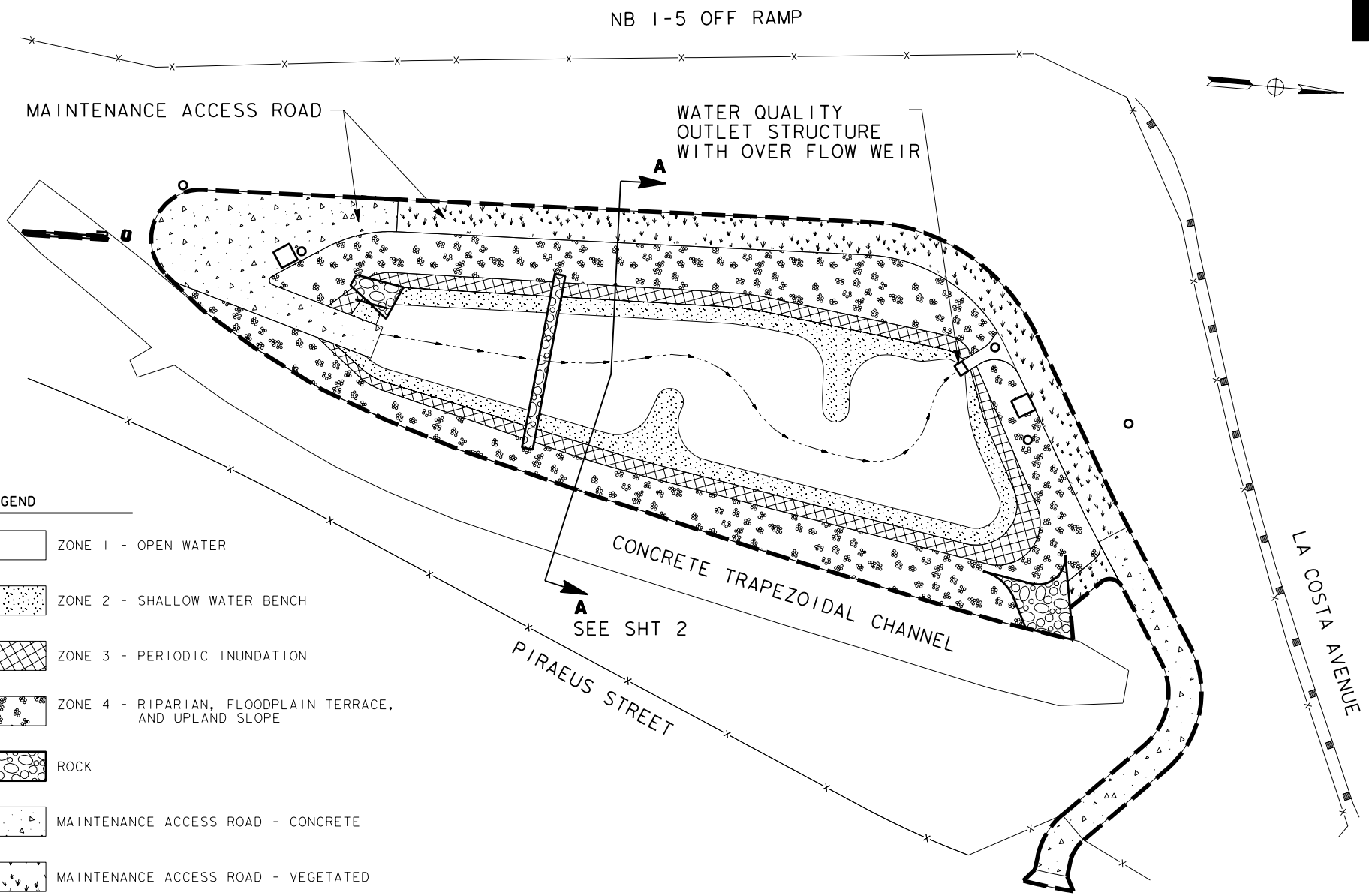
WET BASIN

Preventive Maintenance and Routine Inspections

DESIGN CRITERIA, ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
Maintain Vegetated Access Road to reduce fire hazard from contact with vehicle catalytic converters. *(See attachments.)*	Average vegetation height exceeds 6 inches.	Visual inspection of vegetation throughout maintenance access road.	Annually prior to dry season .	Mow before dry season.	None
Inspect for sediment accumulation in forebay and main pond	More than 2 inches in the forebay and 4 inches in the main pond, or Sediment depth exceeds marker on staff gage. .	Measure in forebay by estimating depth using stationing along concrete maintenance ramp. In main pond by measuring down from water quality orifice and comparing to as-constructed grade.	When pond is drained for Zone 1 vegetation removal, or every 3 years.	Remove and properly dispose of sediment. By November, restore vegetation to the plan shown on the as-built drawings.	La Costa site only

NOTES:

1. The design storm event is a storm that has a one-year, 24-hour recurrence frequency.
2. A target storm event is a storm greater than 0.75 inches of rainfall. For drain inlet inserts, a target storm event is a storm with a prediction of greater than 0.25 inches of rainfall.
3. Woody wetland vegetation consists of: willows *(Salix spp),* mule fat *(baccharis salicifolia),* cottonwood *(populus fremontii),* and western sycamore *(plantanus racemosa)*. Note, this criterion is not applicable to the wet basin.
4. Zone 1, open water area of the basin, average depth is about 3 feet. Zone 2, shallow water bench, depth of water 0 –12 inches. Zone 3, periodic inundation is the temporary water storage volume impounded between the permanent pool and the overflow weir, i.e. the water quality storage. *(See attachments for zone locations.) Zone A is the remaining upland slope between Zone 3 and the maintenance road.*



Caltrans Metric

SITE 111104
OVERVIEW OF THE I-5/LA COSTA AVENUE WET BASIN BMP ZONE DELINEATION
SHT 1 OF 2

SCALE: 1:400

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

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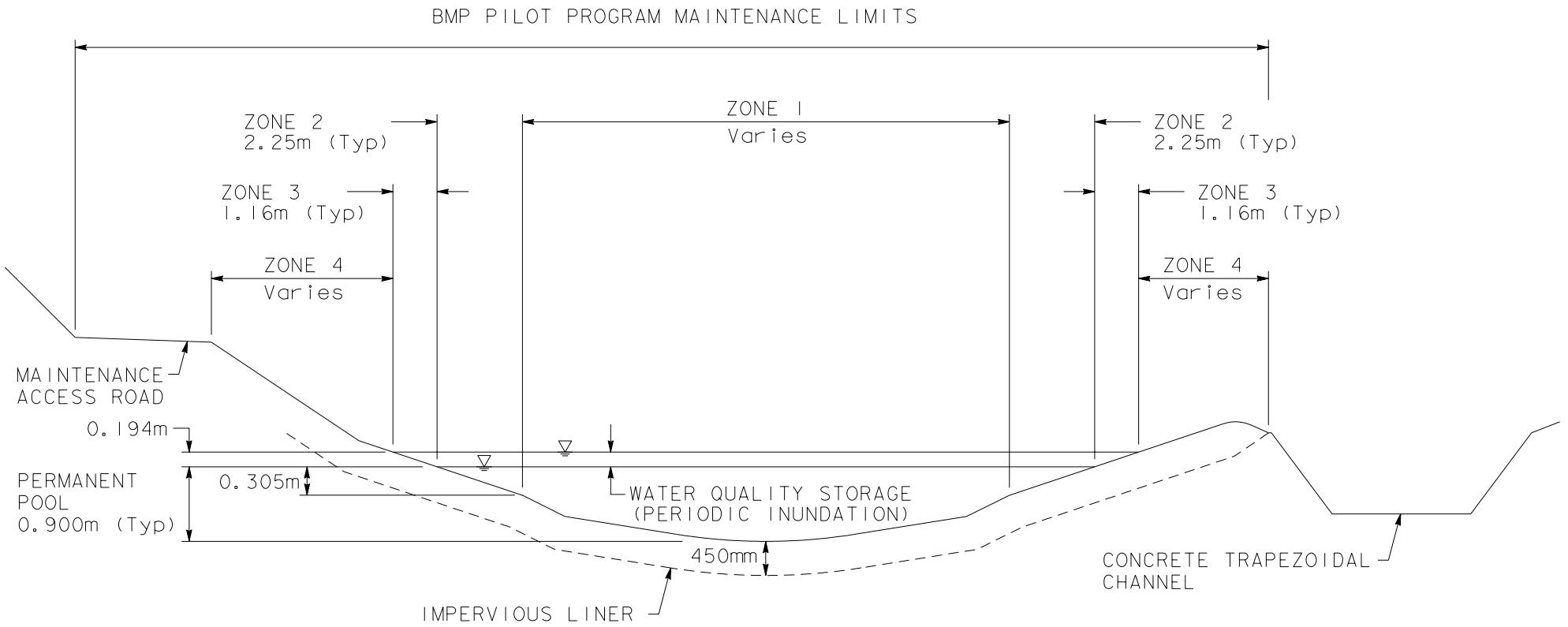

LEGEND

ZONE 1 - OPEN WATER

ZONE 2 - SHALLOW WATER BENCH

ZONE 3 - PERIODIC INUNDATION

ZONE 4 - RIPARIAN, FLOODPLAIN TERRACE, AND UPLAND SLOPE

SECTION A-A

SITE 111104
OVERVIEW OF THE
I-5/LA COSTA AVENUE
WET BASIN BMP
ZONE DELINEATION
SHT 2 OF 2

NOT TO SCALE

14 MAR 2000 13:07:38 gr\grp13\pdata\34618\wetbasin exhibits\wbzone01.dgn